

CLAIMS

1 1. A method for arranging a plurality of orders for printed articles each of which
2 contains one or more printed articles, in order to reduce wasted space when printing the
3 orders in multiple columns, the method comprising the steps of:

4 obtaining a plurality of orders for at least one printed article;
5 sorting the orders according to the number of printed articles in each order to
6 produce a sorted arrangement of the orders; and
7 for each successive order in the sorted arrangement of orders placing the order
8 in a column which currently has a lowest number of total printed articles.

1 2. The method of claim 1 further comprising the step of:
2 placing the first K orders in the sorted arrangement of orders in columns 1 to K
3 where K is the total number of columns.

1 3. The method of claim 1 further comprising the steps of:
2 determining the number of printed articles in a lth group in an Mth column;
3 determining the number of printed articles in the Mth column;
4 determining the number of printed articles in a Jth group in a Nth column;
5 determining a number of printed articles in the Nth column; and
6 exchanging the lth and Jth groups between the Mth and Nth columns if:
7 $(L(M) > L(N) \text{ AND } L(I, M) > L(J, N) \text{ AND } L(M) - L(N) > L(I, M) - L(J, N)) \text{ OR}$
8 $(L(M) < L(N) \text{ AND } L(I, M) < L(J, N) \text{ AND } L(N) - L(M) > L(J, N) - L(I, M))$
9 where $L(M)$ is the number of printed articles in the Mth column,
10 $L(N)$ is the number of printed articles in the Nth column,
11 $L(I, M)$ is the number of printed articles in the lth order of the Mth column, and
12 $L(J, N)$ is the number of printed articles in the Jth order of the Nth column
13 is true.

EXPRESS MAIL NO.: EL563155095US

4. A method for rearranging a data structure representing a multi column arrangement of a plurality of groups of printed matter the method comprising the steps of:

determining the number of printed articles in a l th group in a M th column;

determining the number of printed articles in the M th column;

determining the number of printed articles in a J th group in a N th column;

determining a number of printed articles in the N th column; and

exchanging the l th and J th groups between the M th and N th columns if:

$(L(M) > L(N) \text{ AND } L(I, M) > L(J, N) \text{ AND } L(M) - L(N) > L(I, M) - L(J, N)) \text{ OR}$

$(L(M) < L(N) \text{ AND } L(I, M) < L(J, N) \text{ AND } L(N) - L(M) > L(J, N) - L(I, M))$

where $L(M)$ is the number of printed articles in the M th column,

$L(N)$ is the number of printed articles in the N th column,

$L(I, M)$ is the number of printed articles in the I th order of the M th column, and

$L(J, N)$ is the number of printed articles in the J th order of the N th column

is true.

5. The method of claim 4 further comprising the step of iteratively selecting different combinations values of M and N .

6. The method of claim 4 further comprising the step of: iteratively selecting different combinations of values of I and J .

EXPRESS MAIL NO.: EL563155095US

7. A computer readable medium containing programming instructions for rearranging a data structure representing a multi column arrangement of a plurality of groups of printed matter, including programming instructions for:

determining the number of printed articles in a l th group in a M th column;

determining the number of printed articles in the M th column;

determining the number of printed articles in a J th group in a N th column;

determining a number of printed articles in the N th column; and

exchanging the l th and J th groups between the M th and N th columns if:

$(L(M) > L(N) \text{ AND } L(I, M) > L(J, N) \text{ AND } L(M) - L(N) > L(I, M) - L(J, N)) \text{ OR}$

$(L(M) < L(N) \text{ AND } L(I, M) < L(J, N) \text{ AND } L(N) - L(M) > L(J, N) - L(I, M))$

where $L(M)$ is the number of printed articles in the M th column,

$L(N)$ is the number of printed articles in the N th column,

$L(I, M)$ is the number of printed articles in the I th order of the M th column, and

$L(J, N)$ is the number of printed articles in the J th order of the N th column

is true.

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8. A computer readable medium containing programming instructions for rearranging a data structure representing a multi column arrangement of a plurality of groups of printed matter the computer readable medium including programming instructions for:

determining the number of printed articles in a I th group in a M th column;

determining the number of printed articles in the M th column;

determining the number of printed articles in a J th group in a N th column;

determining a number of printed articles in the N th column; and

exchanging the I th and J th groups between the M th and N th columns if a

boolean expression:

$(L(M) > L(N) \text{ AND } L(I, M) > L(J, N) \text{ AND } L(M) - L(N) > L(I, M) - L(J, N)) \text{ OR}$

$(L(M) < L(N) \text{ AND } L(I, M) < L(J, N) \text{ AND } L(N) - L(M) > L(J, N) - L(I, M))$

where $L(M)$ is the number of printed articles in the M th column,

$L(N)$ is the number of printed articles in the N th column,

$L(I, M)$ is the number of printed articles in the I th order of the M th column, and

$L(J, N)$ is the number of printed articles in the J th order of the N th column

is true.

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9. A system for producing custom printed articles comprising:
- a high speed printer;
 - a server electrically coupled to the high speed printer the server including:
 - a processor programmed to:
 - determine a number of printed articles in a Ith group in a Mth column;
 - determine a number of printed articles in the Mth column;
 - determine a number of printed articles in a Jth group in a Nth column;
 - determine a number of printed articles in the Nth column; and
 - exchange the Ith and Jth groups between the Mth and Nth columns if a
- boolean expression:
- $(L(M) > L(N) \text{ AND } L(I, M) > L(J, N) \text{ AND } L(M) - L(N) > L(I, M) - L(J, N)) \text{ OR}$
 $(L(M) < L(N) \text{ AND } L(I, M) < L(J, N) \text{ AND } L(N) - L(M) > L(J, N) - L(I, M))$
- where $L(M)$ is the number of printed articles in the Mth column,
 $L(N)$ is the number of printed articles in the Nth column,
 $L(I, M)$ is the number of printed articles in the Ith order of the Mth column,
- and
- $L(J, N)$ is the number of printed articles in the Jth order of the Nth column
is true.